REMARKS

Claim 13 stands rejected under 35 U.S.C. §102(b) as being anticipated by Clark. Applicant respectfully traverses the rejection. Clark fails to teach or suggest the specific, discrete sizes claimed. Instead, Clark teaches one or more continuous ranges of particle sizes. Further, Clark fails to anticipate the claim because the size ranges disclosed in Clark lack sufficient specificity to anticipate the claim. Accordingly, Applicant respectfully submits that the rejection is improper and requests withdrawal of the rejection.

Claim 13 clearly and specifically defines a family of discretely and uniformly sized elemental silicon nanoparticles, and specifically defines the nanoparticle sizes within the family. The Office Action states, "No difference is seen between the instantly claimed invention and the invention of Clark, Jr." However, there is a clear difference between discrete, uniform sizes, and a distribution or range of particle sizes. Though the Office Action further states that Clark does not describe particles in terms of a distribution, Clark clearly and consistently describes its particles in terms of several ranges. See, for example: col. 3, lines 43-48 (disclosing "at least a portion of the particles" within three different, continuous ranges: less than 1000 nm, less than 100 nm, and less than 10 nm); col. 8, lines 19-22 (disclosing particles in the range of several nanometers); col. 8, lines 58-59 (disclosing that "a range of nanoparticle sizes may be expected to be produced by a given particle etch process"); and claims 21-23 (disclosing that "at least a portion of the particles are less than 1000, 100, and 10 nm respectively). Claim 13, by contrast, defines a family of discrete and uniformly-sized nanoparticles.

Additionally, because Clark merely provides ranges, it apparently is equally likely that the particles are any one particle size within that range, and not necessarily any particular particle size. Clark does not disclose or suggest that its procedure can produce a specific size particle within a given range. This is supported by Clark's description of overlapping ranges (less than 10, less than 100 and less than 1000 nm). Only upper limits are provided, and these are only for a "portion" of the particles.

Though Clark states that nanoparticles may be "fine-tuned" to reduce dimensions and achieve a precise desired dimension, Clark does not disclose that the resulting nanoparticles would be, or could be, a family of particles substantially consisting of any of the discrete sizes claimed. Further, Clark fails to specifically teach that the starting or resulting nanoparticles of the "fine-tuning" are less than 10 nm in any event. See col. 11, lines 33-48. Clark does not teach any beginning or ending size for the nanoparticles in this process. Thus, the starting and ending nanoparticles for the "fine-tuning" process could be nanoparticles having sizes up to 1000 nm.

Still further, Clark does not anticipate the claimed discrete particle sizes because Clark fails to disclose any exemplary particle size equal to the particle sizes claimed, nor does it disclose any of the discrete particle sizes claimed with sufficient specificity. As clearly provided in MPEP 2131.03, to anticipate a range, the prior art must either: 1) provide a specific example that is within a claimed range; or 2) teach a range within, overlapping, or touching the claimed range, and the prior art must disclose the claimed range with "sufficient specificity". The cited reference, Clark, does neither.

Claim 13 defines discrete sizes of 1, 1.67, 2.15, 2.9, and 3.7 nanometer nanoparticles. Thus, claim 13 defines specific, discrete sizes for silicon nanoparticles, not a general range of particle sizes.

Clark fails to teach any one of the specific silicon nanoparticle sizes claimed. Particularly, Clark fails to teach, or provide examples for silicon nanoparticle sizes of 1, 1.67, 2.15, 2.9, or 3.7 nm. Instead, Clark teaches that nanoparticles under 10 nm can be produced (more particularly, silicon nanoparticles can be produced that emit visible light when subjected to UV radiation), and that "nanoparticles" can be made smaller. This smaller size is likely also a range. Thus, Clark fails to teach any of the specific sizes within the list.

Because Clark does not teach any of the specific nanoparticle sizes claimed, the Office Action relies on the "less than 10 nm" range disclosed in Clark to support its anticipation rejection. Particularly, the Office Action states that the particle sizes in Clark's range "clearly embrace" the claimed sizes. However, Clark fails to disclose the claimed subject matter with sufficient specificity. "Clearly embracing" is not enough. As stated in MPEP 2131.03:

> When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." What constitutes a "sufficient specificity" is fact dependent. If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an

anticipation of the claims. The unexpected results may also render the claims unobvious.

Claim 13 defines silicon nanoparticles having one of a list of specific, discrete particle sizes. Thus, the range is very narrow – it is 5 discrete sizes. The application describes several benefits from producing particles within this narrow range, including good electronic, chemical, and structural qualities of the particles, as well as efficient and intense emission characteristics in specific, clearly classifiable bands.

Clark, by contrast, teaches several broad, continuous ranges or distributions for silicon nanoparticle sizes: ranges having a portion that is less than about 1000 nanometers, ranges having at least a portion that is less than about 100 nm, and ranges having at least a portion that is less than about 10 nm. The most specific and relevant of these ranges, "having at least a portion less than about 10 nm", is not very specific at all. Clark clarifies the meaning of this range, and the reason for its lack of specificity, in Col. 8, lines 51-59:

> In the example given above, in which bulk silicon was etched in an electrolytic solution of BHF and an alkanolamine, silicon nanoparticles were formed. When illuminated with ultraviolet light, the produced silicon nanoparticles luminesced in the visible light region. This luminescence indicated that at least a fraction of the nanoparticles were of a size dimension of no greater than about 10 nm. A range of nanoparticle sizes may be expected to be produced by a given particle etch process.

Thus, the "less than (or no greater than) 10 nm" range is derived from viewing "at least a fraction" of the produced silicon nanoparticles, and seeing luminescence "in the visible light region". Clark also does not disclose a particular color for the visible light, and thus no particular particle size can be determined. The color of the light emitted by silicon

nanoparticles under excitation by UV light is strictly dependent on the size of the particles. In Claim 13, as opposed to Clark, discrete sizes are defined, and in the present specification specific colors are described that are dependent on these discrete sizes. Further, Clark does not state that the particles are formed in discrete and uniform sizes, but instead suggests the opposite: that visible light is provided only by "at least a fraction" of the particles. Clark makes this point clear by stating, "A range of nanoparticle sizes may be expected to be produced by a given particle etch process".

As stated above, Clark teaches that the particles "can be further processed to 'fine-tune' their dimensions" (indicating that a range is produced), and that a "precise desired nanoparticle dimension" can be achieved. However, Clark provides no specific sizes, let alone specific sizes below 10 nm or any of the specific sizes claimed. Clark also fails to state how precise its "fine-tuning" method can be, but instead it only provides exemplary sizes in terms of ranges.

Further, Clark fails to teach a family of silicon nanoparticles substantially consisting of one or more of the discrete sizes claimed, as it fails to teach or suggest that the result, even after "fine-tuning", provides a family of uniform, discrete particle sizes. The "fine-tuning" method of Clark disclosed in col. 11, lines 33-48 suggests that the result still would be a distribution or range of particles, but having a lower upper limit cutoff (i.e., the "desired nanoparticle dimension") than before.

Additionally, Clark does not specifically provide that its particles can be etched down to any of the specifically claimed sizes. No lower-limit cutoff for particle size is

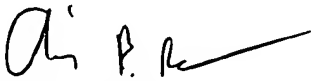
provided in the reference. "Fine-tuning" as taught in Clark will likely have limits, but no such limits are specified in Clark.

Thus, Clark fails to anticipate claim 13. For at least this reason, the rejection is improper and should be withdrawn. If this rejection is withdrawn and a new rejection is made, Applicant respectfully requests that the finality of the rejection be withdrawn.

For all of the above reasons, Applicants request reconsideration and allowance of the application. Should the Examiner believe that an interview would expedite prosecution, the Examiner is invited to contact the undersigned attorney at the below-listed number.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 

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